

**Albert Costa: The Bilingual Brain: And What It Tells Us
about the Science of Language**

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This book presents twenty years of research in the field of the cognitive science of language and bilingualism, initially written in Spanish by Albert Costa and translated by John W. Schwieter. The author was a Research Professor at Pompeu Fabra University in Barcelona and Director of the Speech Production and Bilingualism Group at the Centre for Brain and Cognition. His research focused on the cognitive and neural basis of language processing.

This book aims to show how two languages can coexist in the same brain, find answers to questions raised concerning the bilingual advantage from infancy to old age and respond to additional questions about language interaction and cognitive functions, which examine attention, decision-making, and learning.

In Chapter 1- entitled *Bilingual Cradles*- the author discusses studies on bilingual infants by examining different techniques for measuring bilingualism in babies and describing how the linguistic systems of bilingual children develop. The chapter includes a summary of studies on four-month-old Spanish-Catalan bilinguals which shows that bilingual infants can discriminate between the two languages and track phonotactic patterns in the stream of speech, moreover demonstrating that their sensitivity to the relevant features begins at birth concerning the phonological contrasts specific to their native language, thereby losing their initial sensitivity to contrasts that do not occur in the language they are acquiring as their L1. Furthermore, it investigates studies on the importance of social contact when learning.

Chapter 2 - entitled *Two Languages, One Brain* - Costa addresses cortical representations of the distributed neural circuits. This chapter describes how the two languages are represented in the brains of adult bilinguals as well as includes studies from cognitive neuroscience and neuropsychology. It offers a brief insight into the areas of the brain involved in the representation and control of two languages. The author also highlights the effects of brain damage on the representation and control of two languages in the case of Spanish-Catalan bilinguals diagnosed with Alzheimer's disease. Chapter 2 also describes bilingual aphasia, where an important comparison is made between associated and dissociated deficits. An associated deficit refers to two or more language disorders that occur simultaneously due to damage to a specific area of the brain (p. 33). The studies included in this chapter show parallel impairments in both languages following brain damage. Parallel impairments also suggest how some domains are interdependent rather than domain-specific. Although the chapter refers to "systems" that can be regarded as "circuits," the number of "regions" should not be underestimated. Despite the progress made to date, this subject is still in its infancy in the literature.

The central focus of Chapter 3 is to find answers to the following question: How does bilingualism shape the brain? This question stems from the discussion in the previous chapter on how the L1 and L2 are represented in the brain while making a distinction between processing components like task-specific interface mechanisms and competence and contrasting knowledge with representation. It analyses the impact of learning and using two languages on language processing in general. Furthermore, this chapter compares the brains of bilinguals and monolinguals and shows that the cortical representations of a bilingual's L1 are generally quite similar to those of a monolingual. Costa also provides numerous examples of how bilingualism positively or negatively affects language processing, such as naming tasks. The studies included in this chapter that examine the positive and negative effects of bilingualism on language processing show that bilinguals access their mental lexicon less efficiently than monolinguals when tested in their dominant language.

The fourth chapter describes the effects of bilingualism on the attentional system by providing case studies suggesting that bilinguals have a more efficient attentional system that is more resistant to brain damage. It gives an insight into studying the attentional system at both the behavioural and linguistic levels. In addition, this chapter reviews studies on participants ranging from seven months to eighty years of age to investigate their attentional systems. In the case of infants, a study is presented in which task switching was measured in monolinguals and seven-month-old bilinguals. This study is significant because it shows the effect of bilingualism on the cognitive flexibility of very young infants. In the case of elderly bilinguals, Costa suggests that bilingualism may promote cognitive reserve in neurodegenerative diseases; for instance, a study in this chapter describes how bilingual participants diagnosed with Alzheimer's disease or other neurodegenerative diseases tend to start visiting a neurologist four years later than their monolingual counterparts, implying that bilingualism promotes the development of cognitive reserve, which in turn reduces the adverse effects of this disorder.

The last chapter introduces the key topic of how using a second language can affect decision-making processes by presenting the significance of the communicative context and meeting milestones like explaining jokes and using swear words correctly in a second language. Chapter 5 presents two systems in connection with decision-making (an intuitive system and a logical and reflexive one). The author describes how intuitive processes are diminished when using a second language. In addition, Costa discusses how language can modify our economic and moral decisions in addition to language's role in social categorization.

The book is written for the general public as well as students in the field of bilingual studies by presenting studies in a different way illustrated by everyday examples, e.g., bilingual Formula One drivers and quotes from *The Godfather*, to

make academic findings more understandable. Anyone with no previous experience of bilingualism would enjoy reading this book since it portrays science as exciting and puts the reader at ease with the subject while, at the same time, gaining a fascinating insight into it.

Reference

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